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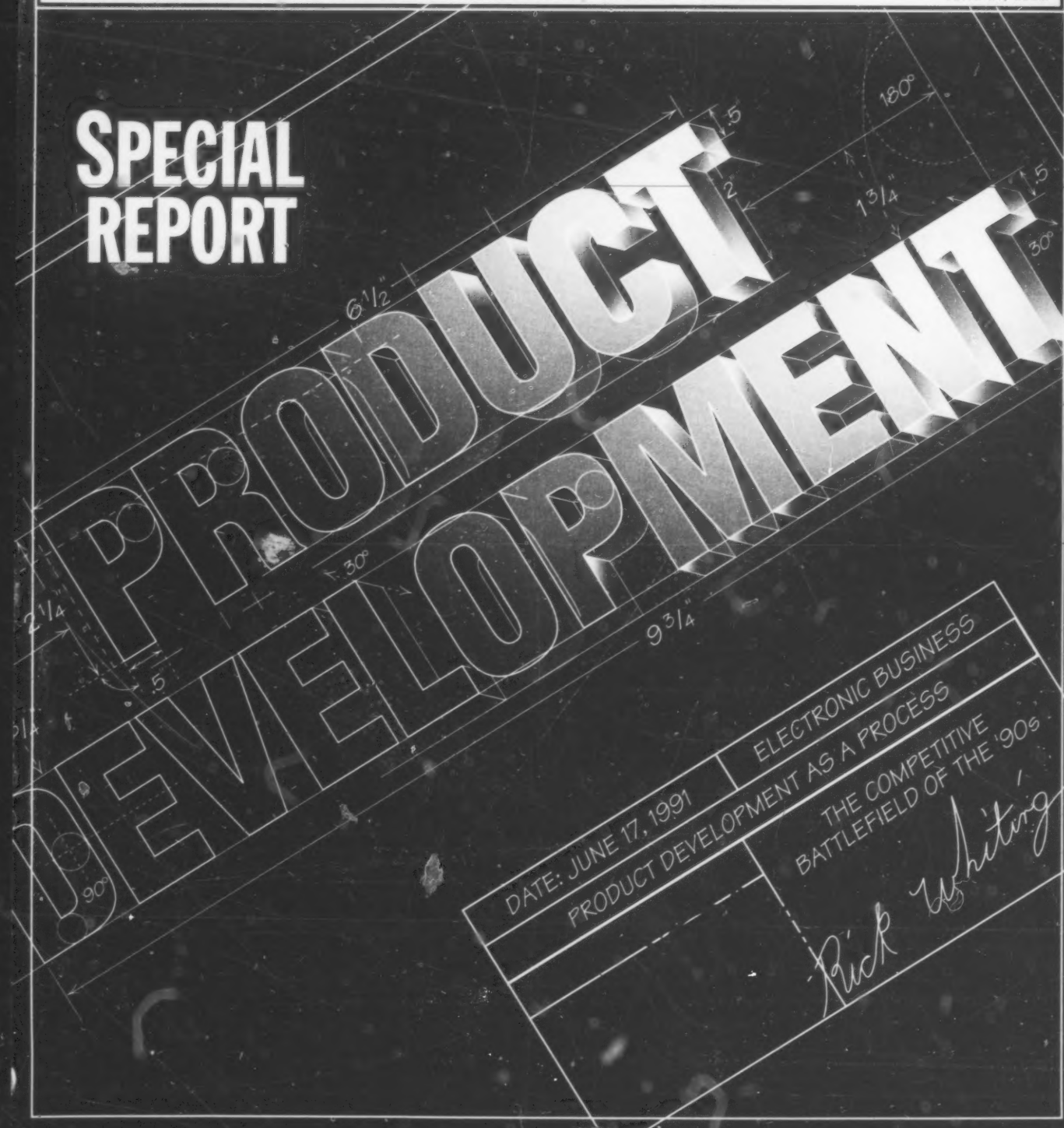
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Electronic Business®

FOR THE MANAGEMENT TEAM IN ELECTRONICS, COMPUTER, AND SYSTEMS COMPANIES—WORLDWIDE

JUNE 17, 1991

**SPECIAL
REPORT**



DATE: JUNE 17, 1991

ELECTRONIC BUSINESS

PRODUCT DEVELOPMENT AS A PROCESS

THE COMPETITIVE
BATTLEFIELD OF THE '90s

Rick Whiting

Electronic Business

FOR THE MANAGEMENT TEAM IN ELECTRONICS, COMPUTER, AND SYSTEMS COMPANIES—WORLDWIDE

VOLUME 17, NO. 12

JUNE 17, 1991

SPECIAL REPORT

COVER STORY

29 Competitive battlefield of the '90s

Over the past decade, the U.S. electronics industry has ceded a critical advantage to Japan by moving too slowly to adopt improved manufacturing techniques. Today, electronics companies stand to gain—or lose—an equally important advantage in how they plan and develop new products. The art and science of product development, in fact, now stands to become the hottest competitive battleground of the 1990s

Cover illustration by Chuck Mackey

UPFRONT

Business Trends

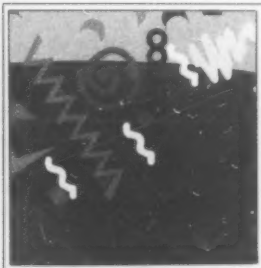
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SPECIAL REPORT

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INSIDE BUSINESS

The next big challenge: cutting time to market

HISTORY WILL witness that focusing on short-term profitability cost U.S. companies in manufacturing quality, the business battlefield of the 1980s. But history doesn't have to repeat itself.

The arena of the 1990s will be product development, the subject of this issue's special report. "If the '80s were rife with manufacturing terms such as 'just in time,' the resounding slogan of the '90s will be 'time to market,'" says senior editor Rick Whiting. The rewards of cutting time to market are substantial: increased product revenue, reduced costs, and quickened response to the competition.

Experts agree that the quality lessons of the '80s can be used to capture those objectives. Documenting and benchmarking performance can help create a stable and predictable product development process; and, as with total quality management, it's the *process*, not the specific program, that makes the difference, and involvement in the development process should extend to suppliers. A prime example is the collaboration between computer maker Compaq and chip maker Intel, which let Compaq bring its Deskpro 386 computer to market in a scant six weeks.

Cutting time to market will mean



Senior editor Whiting: the process, not the program

breaking some long-standing habits, among them the penchant for hanging on to failing projects rather than admitting to a mistake and canceling it early on. It means shifting from top-down supervision to a team development model.

For inspiration, U.S. executives can look across the Atlantic to the \$122-million-a-year

effort underway at Thomson Consumer Electronics. As London bureau chief Barbara Berkman reports, Thomson faces a major challenge in bringing its HDTV systems to market quickly—from competitor Sony Corp. and from Thomson's own weak record in time to market.

Since U.S. electronics companies were caught napping by quality-conscious Japanese manufacturers in the great campaign of the '80s, it is wise to look at the Japanese strategy for the product development struggle. That strategy gets a thorough examination from consulting editor Lew Young, a longtime observer of the Asian electronics industry.

Winning the time-to-market competition will require major changes in organization and corporate culture, but with so much at stake, it's a good bet that many of our readers will meet the challenge.

—John Parker, contributing editor

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SEMICONDUCTORS

Chip makers advised to study Eastern Europe for new markets

THE WORLD semiconductor market will grow substantially during the next nine years, concluded a forum of industry-watchers at the annual In-Stat Inc. conference in May. But for U.S. companies, the most promising market opportunities will be in Eastern Europe, not in the States.

Worldwide semiconductor sales are expected to grow from \$54 billion this year to almost \$200 billion by the year 2000, industry executives predict, with the most spectacular growth coming from Korea, and Western and Eastern Europe. The U.S. market can expect only modest gains until the end of the decade.

Experts say impressive growth rates will come from developing nations. Eastern Europe, which now substantially lags the rest of the world in semiconductor production, may be a potent force by the end of the decade, says Malcolm Penn, president of In-Stat's European operation.

Until then, the Eastern European market represents the single largest market opportunity for U.S., Asian, and Western European chip companies, Penn says, because relaxed export restrictions will make it easier to sell there. Eastern European countries now import very few products from the West, but Penn says that is changing.

In 1990 the entire Eastern European market was worth about \$2.11 billion, or roughly the same as the United Kingdom or what was formerly West Germany, Penn says. The Eastern Europeans have a production capacity worth about \$2.06 billion, or about half the size of NEC's or Toshiba's, he added.

Asia-Pacific countries will do well in the next decade as well, industry experts say. Sales of Korean chips will grow from \$8.4 billion to slightly more than \$40 billion by the end of the decade, says C. S. Park of

Eastern Europe semi production

(\$ millions)

USSR	1300
East Germany	250
Poland	130
Yugoslavia	103
Czechoslovakia	100
Other*	231

1990 total: \$2.11 billion

*Other includes Bulgaria, Hungary, and Rumania

Source: In-Stat

Hyundai Electronics in Korea. To support that growth, the Korean industry plans huge investments in capital equipment over the next four years. The industry will invest \$1 billion in equipment this year, and

\$1.8 billion by 1993.

But Park warned that his nation's economy is too dependent on DRAMs for its long-term health, and that Korean companies must make the switch to other products.

The now-sluggish U.S. chip market will grow between 12% and 13% per year during the decade, conference attendees predict. Driving that increase will be greater demand for microprocessors incorporating more and more functionality. The technology of application-specific ICs will continue to proliferate, making sales of specialty chips mushroom in the coming years.

But industry watchers warn that if U.S. executives are looking to the DRAM market for help, they should think again. That market will continue to be volatile, and although the chips will be increasingly important as memory-intensive products such as HDTV come on line, prices will be uneven through the decade.

Chip sales in Western Europe will

Industry bids farewell to Sporck



On May 23, Charlie Sporck, president and CEO of National Semiconductor, retired after 31 years in the semiconductor industry. The evening was marked by hugs and reminiscing, rowdy stories and sincere admiration. Recalling early days at Fairchild Semiconductor, Gordon Moore, chairman of Intel Corp., noted, "to say there was a healthy tension between marketing and manufacturing during our meetings is an understatement. Charlie once broke his hand pounding the table."

Cindy Charles

grow only 7.3% this year, but demand should skyrocket as the market unifies by the end of 1992, says In-Stat's Penn. Semiconductors for the communications and computer markets will be strong sellers over the next nine years.

—Valerie Rice

SEMICONDUCTOR STATISTICS

Why the semi rankings don't always add up

WHEN INTEGRATED Circuit Engineering Corp. and ELECTRONIC BUSINESS ranked the top 50 IC manufacturers (Apr. 8), many readers wondered why the rankings by different consultants didn't add up to the same number.

One reason is that analysts do not simply copy numbers from annual reports. The process of tallying semiconductor sales is complex; the task is further complicated by the method each consultant uses to treat internal transfers and subcontracting. All try to avoid double-counting figures, and as subcontracting becomes more prevalent, the room for errors increases. "If Intel gets EPROMs from Samsung, we try to eliminate it from the total," says ICE's Bill McClean. "But sometimes it creeps in."

What type of components does each consulting house include? According to sources, San Jose's Dataquest includes hybrids, which makes their semiconductor-revenue figures (especially in the case of Japanese companies) higher than

those of other consultants. ICE tries to count only the value of the IC that goes into the packet, so the module's packaging charges are not included. Some consultants include nonrecurring engineering charges. The Semiconductor Industry Association and In-Stat (which pegs their data to SIA figures) exclude such engineering charges.

Add to the confusion different conversion factors as yen are translated into dollars and fiscal years into calendar years, along with disclosure problems from European companies and competing companies, and it's little wonder that the top semiconductor lists from consultants are all different.

No matter which company is the leader, the worldwide market should come to some \$54 billion this year—at least according to a recent In-Stat forum. But as one analyst told ELECTRONIC BUSINESS, "All the numbers evolve. There are no absolutes."

—Elizabeth B. Baatz

INTERNATIONAL

EC moves to save European HDTV

IN A COMPROMISE to appease feuding European television manufacturers and broadcasters, the European Commission proposes to save the so-called MAC broadcasting standard as a precursor to a European standard for high-definition TV.

The Commission is expected to rule that, by the end of 1991, all

high-end TVs be MAC-compatible; lower-end models could remain based on PAL, the current broadcast standard, until European unit demand for MAC systems reaches a yet-to-be-determined critical mass. At that time, all European broadcasters must switch to MAC.

The compromise was necessary after British and German broadcasters from Europe's fledgling satellite broadcast industry argued to the Commission that the advanced PAL standard is a fine alternative to MAC. They want to continue broadcasting in PAL because it dwarfs today's MAC market. The broadcasters added that at \$6,000 per set, few consumers can afford to buy the MAC-based units now being developed by N.V. Philips, Thomson Consumer Electronics, Grundig, and Nokia.

HDTV was supposed to be the savior of Europe's consumer-electronics manufacturers, and the EC and individual governments have spent millions of dollars so far funding Eureka-95, a project charged with producing a working European HDTV system by 1995. Eureka members chose MAC over PAL as the route to European HDTV, arguing it was more expensive but technically superior. They plunged ahead on MAC-based decoders, receivers, and TV sets.

But the MAC decoder market in Britain went virtually overnight from 750,000 potential units to zero when two competing satellite broadcast companies merged then decreed it would broadcast in PAL and abandon MAC by next year. The effect on Thomson's and Philips's product development was devastating. Thomson, whose first HDTV-compatible television, based on MAC, was due to hit the British market in 1991, closed its 45-engineer MAC decoder research site. "It makes it harder to promote an HDTV format in the U.K.," agrees David Brooks, at Thomson Consumer Electronics' R&D labs.

—Barbara N. Berkman

Continued on page 12

Top semi makers according to three consultants

1990 U.S. chip sales (\$ millions)

Dataquest		ICE		In-Stat	
NEC	4,952	NEC	4,795	Toshiba	4,326
Toshiba	4,905	Toshiba	4,620	NEC	4,005
Hitachi	3,927	Hitachi	3,675	Hitachi	3,460
Motorola	3,692	Motorola	3,590	Motorola	3,433
Intel	3,135	Intel	2,915	Intel	2,941

Compiled by ELECTRONIC BUSINESS

deemed DOD-compliant, as will all of its products. That means no more teams of auditors each time a new product is released, and no more superfluous product testing at various temperatures or humidities.

But getting the DOD's OK is not painless; the process normally takes at least two years. That's how long it took for Intel Corp.'s defense systems division, says general manager Ron Williams. Once the applicant has provided statistical proof of the quality processes and results, the vendor undergoes a validation audit; if successful, the vendor is put on a validated manufacturers list. For a year after that, statistical process data must be sent to the Defense Electronics Supply Center on a weekly basis. The final step is a one-week audit by DESC, after which the vendor joins the ranks of the qualified.

The Defense Logistics Agency recently allocated about \$2 million to DESC to speed up the program, which started in 1984. But by 1988, the project had floundered due to lack of funding.

—Peter Burrows

TRADE

Small companies find ally in unfair-trade cases

IN EARLY 1989, Geoffrey Wyatt, vice president of a small molecular-measuring instrument company, discovered that a multibillion-dollar Japanese competitor was selling instruments similar to the ones produced by his company at less than half the price, well below what Wyatt Technology Corp. charged for its instruments in the United States. Wyatt knew that his \$8 million company was in serious danger and had to act before the vendor underpriced him out of the market.

But legal assistance was prohibitively expensive for Wyatt Technology, essentially a father-and-son business based in Santa Barbara, Calif. Wyatt's search finally led to a small, relatively unknown agency

COMPETITIVENESS

Designing for quality

QUANTITY AND PRODUCT reliability are the most important factors for success in high-tech markets, according to the American Electronics Association's 1991 Productivity Survey of CEOs, presidents, and general managers of companies in high-tech industries.

Of the 311 companies included in the survey, quality of engineering design was mentioned by 77% of the companies as having a major impact on profitability. The survey indicates that more com-

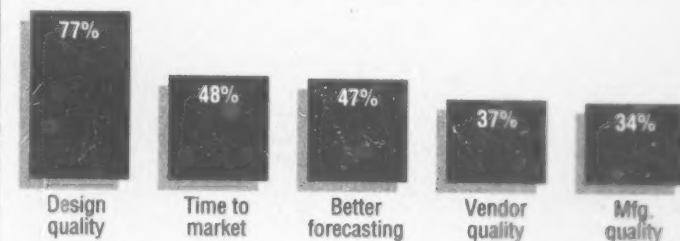
panies are getting the manufacturing function involved earlier in design activities in order to address the quality issue. Competition from foreign companies, especially those from the Pacific Rim, is in part responsible for the emphasis on product quality and time to market.

The survey was conducted for the AEA by consulting firm Pitaglio Rabin Todd & McGrath, especially those from the Pacific Rim, is in part responsible for the emphasis on product quality and time to market.

—Barbara Jorgensen

Issues affecting profitability

(frequency mentioned as top-three success factors)*



* multiple responses allowed

Source: KPMG Peat Marwick, AEA, and PRM

within the International Trade Commission known as the Trade Remedy Assistance Office.

Within three months, the ITC barred the Japanese vendor from shipping its instruments pending an investigation of Wyatt's dumping allegations. Six months later, the ITC slapped a 130% tariff on Otsuka Electronics, the offending company.

TRAO provides a helping hand to small U.S. companies—those with fewer than 500 employees against unfair foreign trade practices. "We were facing this huge Japanese corporation that had some of the best legal counsel money can buy, and we beat them," muses Wyatt. "And it took less than nine months. It's a

very quick process."

A U.S. company has only to allege that its technology, as defined by the Trade Act of 1988, is being threatened by foreign trade practices. If the determination is made that a threat to an emerging U.S. technology exists, the ITC determines a recommendation for action to the U.S. Department of Commerce.

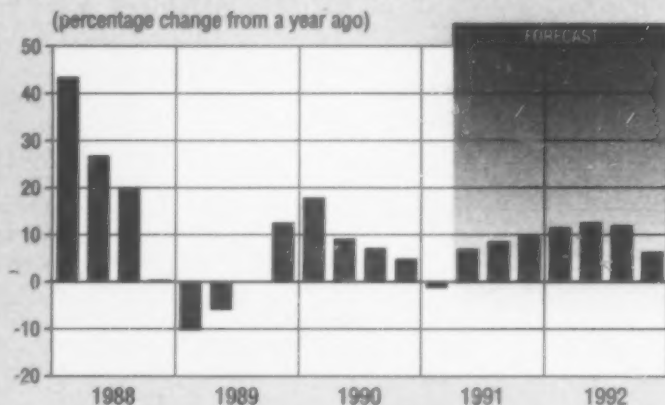
"What's really shocking," says president Philip Wyatt, "is that only 10 companies have gone through [TRAO] in the last year. These guys essentially tell you for free how to protect yourself from dumping."

For information on the TRAO, phone the ITC at (800) 343-9822.

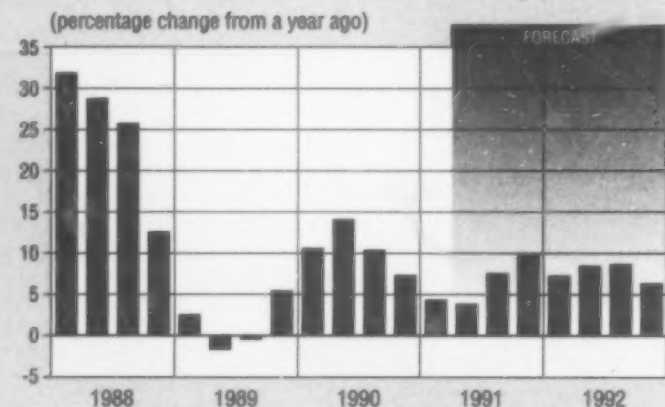
—Dave Webb

Answers: 1. c 2. a 3. Intergalactic Digital Research 4. shoes for walking on water 5. b

Electronic distributor orders rise in early '91...



...while shipments remain steady...



...and distribution outperforms the market



Source: National Electronic Distributors Assn. and Commerce Dept.
Forecast: Cahners Economics

Distributor orders fall, hope for rebound remains

AFTER AN explosion in orders in the first three months of 1990, the nation's largest electronics distributors report that orders dwindled 1.3% during the first quarter of 1991. This is the first time the industry has seen shrinking demand since the second quarter of 1989. The slowdown, however, does not rule out a brisk rebound in the near future.

Distributor orders may have fallen, and the book-to-bill ratio slipped below 1.0 this past March, but there is good news. A more reliable statistic for tracking the health of distribution is electronics distributor shipments. Even though shipments came in somewhat lower than Cahners Economics had predicted, there was still solid growth—4.4% in the first quarter of 1991 compared with a year ago.

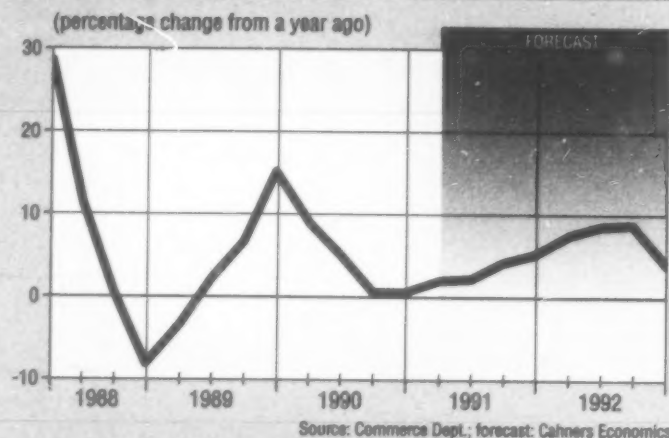
Because first-quarter data came in lower than expected for both shipments and orders, we have lowered our forecasts accordingly. We still expect a rebound in the second half of this year; shipments will advance 6.5% by the end of 1991 and 7.7% next year, and orders are expected to climb 5.9% this year and 10.6% in 1992.

Even though we lowered our distributor forecasts from three months ago, Cahners Economics' forecasts may still seem optimistic given the prevailing low business-confidence levels. However, distributors' shipments and orders growth usually fall in line with that of the electronic components sector. With interest rates expected to fall and computer output forecast to strengthen later this year, distributors' growth will also see an upturn soon.

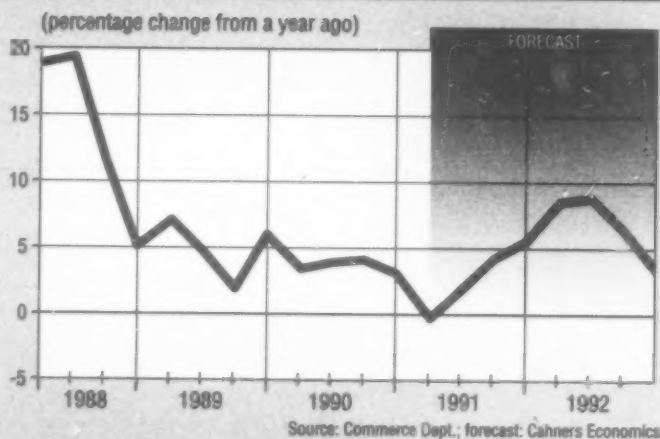
—Julie Handelman

For more information on Cahners Economics' forecasting services, contact Dan Buchan at (617) 630-2105, by fax at (617) 630-2100, or write Cahners Economics, 275 Washington St., Newton, MA 02158, USA

As orders for components begin to rise...



...factory shipments growth follows suit...



...and prices remain low



Components industry poised for mild growth in '91

NOW, ALMOST halfway through 1991, it appears the components industry will see milder growth than originally expected. After rising 3.7% in 1990, new orders for electronic components inched up a meager 2% to \$15.6 billion in the first three months of 1991 from year-ago levels, slightly lower than the 3.5% gain we had originally forecast. The orders path has been far from even: Orders swelled 19% in February and sagged 4.6% in March from year-ago levels.

Component shipments were weak too, slipping 0.3% in the first quarter of 1991 to \$15.2 billion. The last time components shipments fell was in the second quarter of 1986. Despite this small drop, Cahners Economics still expects the industry to see a slight rebound in the second quarter of this year. As output from the computer industry begins to pick up later this year, demand for electronic components will improve as well. Both shipments and orders will see single-digit growth in every quarter this year and in 1992. By the end of this year, electronic component shipments will rise 2.8% and 6.7% in 1992. New orders will grow both this year and next, increasing by 3.4% and 7.2% respectively.

As demand for chips stays low, prices for most electronic components also remains weak. According to ELECTRONIC BUSINESS's sister publication *Electronics Purchasing*, the semiconductor price index stood at 68.5 (July 1989=100) in April, down slightly from the previous month. The trend for the past five months indicates that semiconductor prices have stabilized. It wasn't until this past April that the price index saw a more significant drop in prices. As end-market demand increases and the electronics industry begins to see stronger growth, look for semiconductor prices to rise slightly early next year.

—Julie Handelman